

Prevalence of High Vaginal Swab Microbial Infection in Females of Reproductive Age Group: A Cross Sectional Study

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ABSTRACT

Background: Vaginitis is considered as inflammation of vagina. The type of vaginitis (bacterial vaginosis and candidal vaginitis) depends upon different types of pathogen. Vaginitis was most common problem in women of South Asia. The high vaginal swab (HVS) was an appropriate gynecological investigation related to women. **Objective:** The present study was carried out to determine the prevalence of vaginal infection and isolation of pathogen involved in vaginitis. The percentages of various pathogens in respective age group were also evaluated. **Methods:** It was a cross sectional study carried out in pathology department of CMARTH attached with Azra Naheed Medical College, Raiwind Lahore. A total 100 females belong to reproductive age group (18-45) were taken and proceeded their high vaginal swab culture. All the swabs were subjected to routine bacterial and fungal culture. Identification of positive growth and no growth culture were revealed on blood and MacConkey agar. **Results:** The current study revealed 55% prevalence of vaginal infection and rest of 45% showed no growth. The percentages of different pathogens involved in vaginitis were evaluated including highest prevalence of *Gardnerella vaginalis* was 14.5%, 12.5% of *Staphylococcus aureus*, both *Streptococcus* species and *Candida albicans* showed 10% and other pathogen like *pseudomonas aeruginosa*, *lacto bacillus* and mix growth collectively were 8%. The age group (18-26) showed dominance of *Staphylococcus aureus* and *Candida albicans* was 7%, while age group (27-35) included more occurrence of *Gardnerella vaginalis* was 7% and age group (36-45) also involved peak percentage of *Gardnerella vaginalis* was 6%. **Conclusion:** The current study concluded that bacterial vaginosis was more prevalent. *Gardnerella vaginalis* was the most frequent pathogen involved in vaginal infection. The various types of pathogens were predominant in females of different reproductive age groups.

Keywords: Vaginitis, High vaginal swab culture, Reproductive age, Females, Pathogen.

INTRODUCTION

The inflammation of the vagina is known as vaginitis, that is the most common gynaecological disorder experienced by doctors.^[1-3] In light of the fact that the condition is so frequently self-analysed and self-treated thus the predominance and reasons for vaginitis are unexplained. Furthermore, vaginitis has regularly more than one reason or asymptomatic. Incorporate vaginal decay, hypersensitivities and substance disturbance are considered as non-irresistible causes. The bacterial vaginosis, vulvovaginal candidiasis and trichomoniasis are constituted to 90% vaginitis prevalence, evaluated by most specialists. The range between 9% to 50% is due to bacterial vaginosis with the peak of 70% in female laborers.^[4,5] In 2005, the prevalence of vaginitis was evaluated as 30.7% of bacterial vaginosis, 10% of candidiasis, 7.2% of

trichomoniasis and gonorrhea obtained 1.35% by a cross-sectional study carried out in Quetta, Pakistan.^[6] In Pakistan, the prevalence of pathogen in different age groups was revealed in a research, which showed the predominance of *Lactobacillus* and *E. coli* in females of age group between 20-30 years. While other age group (31-40) revealed the peak of *Lactobacillus*, *Candida* and *E. coli* in females.^[7]

The ordinary vaginal pH in ladies of regenerative age bunch is acidic (≤ 4.5). This generally shields the vagina from the normal pathogenic diseases. In the vagina, *Lactobacillus* is occurred in plentiful numbers as commensal. This bacillus keeps up the acidic pH in the vagina by the creation of lactic corrosive. The standard table is known as Nugent scoring framework had revealed the extent of *Mobiluncus*, *Lactobacillus* and *Gardnerella vaginalis*. High Nugent scores have been related with expanded danger of explicitly communicated contaminations, preterm birth and unfavorable perinatal results.^[8]

In vagina, there was an estrogen lacking state and the insusceptible traded off status because of diabetes or other related vaginal variables can prompt development of anomalous commensals which may

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thus prompt contaminations. Greatest number of ladies looking for treatment was youthful, explicitly dynamic females old enough gathering 26-35 yrs. vaginal contaminations are a typical gynecological issue in the investigation zone. The fundamental inclining factors including helpless cleanliness, low financial status, and early sexual action, for indicative vaginal contaminations. PH is raised in bacterial vaginosis. But it is ≤ 4.5 in vaginal candidiasis. The incorporate physiological, infective (for example bacterial vaginosis, candidiasis, trichomoniasis) and non-infective (unfamiliar bodies, cervical ectopy and genital plot threat) were results in vaginal release.^[9]

The bacterial vaginosis is at present representing $>30\%$ of cases in ladies of childbearing age thus the most widely recognized reason for vaginitis, in the United States.^[10] The expansion of various life forms, including *Gardnerella vaginalis*, *Mycoplasma hominis*, *Mobiluncus* species and *Peptostreptococcus* species is accepted to be brought inflammation.^[11] The progress of herpes simplex infection type 2 (HSV-2), *Trichomonas vaginalis*, *Nesseria gonorrhoeae*, *Chlamydia trachomatis* and as of late HIV obtaining and transmission were carried by exposure of infected women.^[12-14]

MATERIALS AND METHODS

It was a cross sectional study carried out from June 2019 to June 2020 at pathology department of Chaudhary Muhammad Akram Teaching and Research Hospital attached with Azra Naheed Medical College Lahore. A total 100 females belong to reproductive age group were taken and proceeded with high vaginal swab culture. Females of 18-45 years were included and those who were suffering from any current infections, diabetes mellitus and malignancy were excluded. All the high vaginal swabs were subjected to routine bacterial and fungal culture. Identification of positive growth and no growth culture were revealed on blood and MacConkey agar. Isolation and characterization of microbes in positive growth cultures were carried out by gram staining and microscopy. In addition to this biochemical tests were performed to differentiate between different pathogens. The biochemical tests including catalase, oxidase, citrate, DNase, Triple sugar iron (TSI) and indole test. These tests involved different mechanism of color changing, hemolysis of agar, bubbling of gas as well as fermentation of sugar, which results in the characterization of various pathogens.

The statistical analysis was carried out on data obtained from previously microbiological analysis. The statistical tools were used including percentage and frequency.

RESULTS

The current study evaluated the percentages of HVS culture regarding positive growth and negative growth. The total number of samples was 100 out of which 55% showed positive growth, constituted of various type of pathogens while 45% showed no growth [Table 1].

Table 1: Percentages of HVS positive growth and no growth

	Total number (N)	Positive growth	No growth
% age of HVS	100	55%	45%

The percentages of positive HVS culture were categorized on different types of pathogens. The current study isolated pathogens including *Gardenerella vaginalis* showed 14.5% highest growth, 12.5% of *Staphylococcus aureus* which was second highest. Both *Streptococcus* species and *Candida albicans* were ranked at third level with 10%. Others pathogens included *lacto bacillus*, *pseudomonas aeruginosa*, mix growth were collectively given 8% [Table 2].

Table 2: Percentages of positive HVS cultures of various pathogens

S No.	Pathogens	%age of positive HVS Cultures
1	<i>Gardenerella vaginalis</i>	14.5%
2	<i>Staphylococcus aureus</i>	12.5%
3	<i>Streptococcus</i> species	10%
4	<i>Candida albicans</i>	10%
5	Others	8%

The different age groups showed different percentage of positive and negative growth on HVS culture. The highest growth was obtained in age group (18-26) which was 22%. In age groups (27-35) and (36-45) showed positive growth percentages of 17% and 16%, respectively. While the percentages of no growth also varies in different age groups. The highest percentage of no growth showed in age group (27-35). The other age groups including (18-26) was 14% and (36-45) was 11% [Table 3].

Table 3: Percentages of positive growth and no growth in different age group

Age groups	Positive growth	No growth
18-26	22%	14%
27-35	17%	20%
36-45	16%	11%

In age group (18-26) both *Staphylococcus aureus* and *Candida albicans* showed highest peak (7%). *Gardenerella vaginalis* showed the highest peak among age groups (27-35) and (36-45). In age group (18-26) *Gardenerella vaginalis* was 2%, *Streptococcus* species was 6%. Age group (27-35) showed percentages of *Streptococcus* species, *Candida albicans* and others was 2% each, while

Staphylococcus aureus was 4%. The percentages of positive growth of pathogens including Staphylococcus aureus, Streptococcus species, Candida albicans and others were 2%, 2.5%, 1.5% and 4%, respectively [Table 4 & Figure 1].

Table 4: Percentages of various pathogens in different age groups

Pathogens	18-26 age group	27-35 age group	37-45 age group
Gardenerella vaginalis	2%	7%	6%
Staphylococcus aureus	7%	4%	2%
Streptococcus species	6%	2%	2.5%
Candida albicans	7%	2%	1.5%
Others	0%	2%	4%

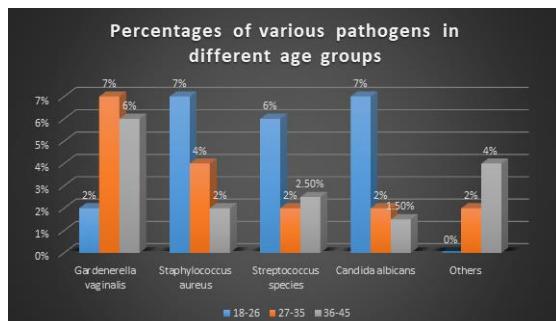


Figure 1: Percentages of various pathogens in different age groups.

DISCUSSION

The current study revealed the prevalence of bacterial as well as candida vaginitis as 55% in high vaginal swab culture. The prevalence of bacterial vaginitis including Gardenerella vaginalis, Staphylococcus aureus, Streptococcus species, lacto bacillus and pseudomonas aeruginosa were 14.5%, 12.5%, 10% and 8%, respectively. The collectively bacterial vaginosis percentage was 45% of above finding was related to previously reported research finding in Quetta city of Pakistan showed prevalence of bacterial vaginosis was 30.7%.^[6] Various African countries Zimbabwe and Tanzania reported prevalence of bacterial vaginosis between 20% to 23% whereas, Uganda and South Africa 34.4% and 58% respectively.^[15-17,19] Douching is believed to alter the dominant flora of the vagina and, thus, increase susceptibility to bacterial vaginosis.^[18,20] All the sampled females within reproductive age group could be one of the facts to show high peak of bacterial vaginosis prevalence, a number of studies had showed that sexually active factor was related to Bacterial vaginitis.^[18,21] and also the utilization of contraceptives related to bacterial vaginosis.^[22] In current finding, candida was the third common pathogen related to vaginitis in HVS culture, showed 10% of prevalence, in accordance to study taken in Pakistan in 2005 reported same 10% of candida prevalence in HVS culture.^[6] The current study

found the high prevalence of candida infection and being the second most common cause of vaginitis is vulvovaginal candidiasis is in accordance to the previous studies.^[23] The Risk factors of candidiasis include the sexual activity as one of the important risk factor for candidiasis and also contraceptives had played a vital role in it.^[24-26] We found Candida and staphylococcus aureus predominance in females of age(18-26years) while Gardenerella vaginalis was most frequent pathogen in age groups (27-35years) and (36-45years). It is also in consistence with previously study carried out in Pakistan which reported Lactobacillus and E. coli was predominant in age group (20-30), while Candida, Lactobacillus and E. coli showed peak prevalence in females of age group (31-40years).^[7]

CONCLUSION

This study concludes that gynaecological infections are common in Pakistani women of reproductive age group. The current study isolated pathogens including Gardenerella vaginalis showed 14.5% highest growth, 12.5% of Staphylococcus aureus which was second highest. Both Streptococcus species and Candida albicans were ranked at third level with 10%. Further multicenter studies are required. HVS screening should be mandatory for reproductive age groups and above. Correct isolation of pathogens is needed for the better selection of drugs.

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